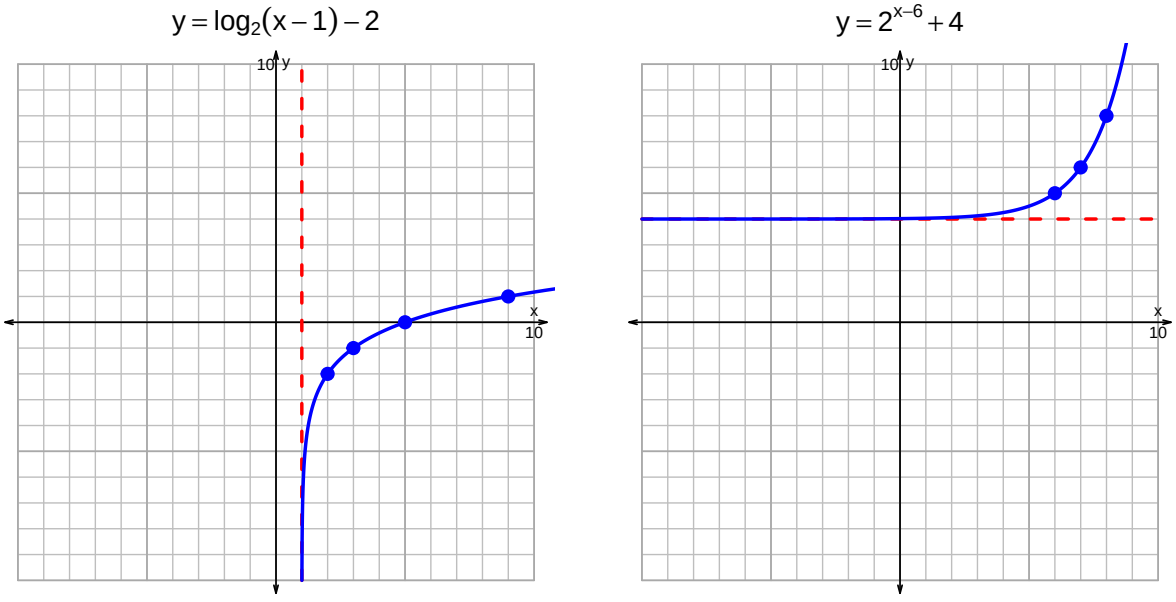
Name: Date:

s18: EXP LOG (SLTN v340)

1. (10 pts) Graph $y = \log_2(x-1) - 2$ and $y = 2^{x-6} + 4$ on the grids below. Also, draw any asymptotes with dashed lines.



Somewhat useful hint: $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$-17 = \left(\frac{-4}{5}\right) \cdot 2^{-3t/7}$$

Divide both sides by $\frac{-4}{5}$.

$$\frac{17 \cdot 5}{4} = 2^{-3t/7}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{17 \cdot 5}{4}\right) = \frac{-3t}{7}$$

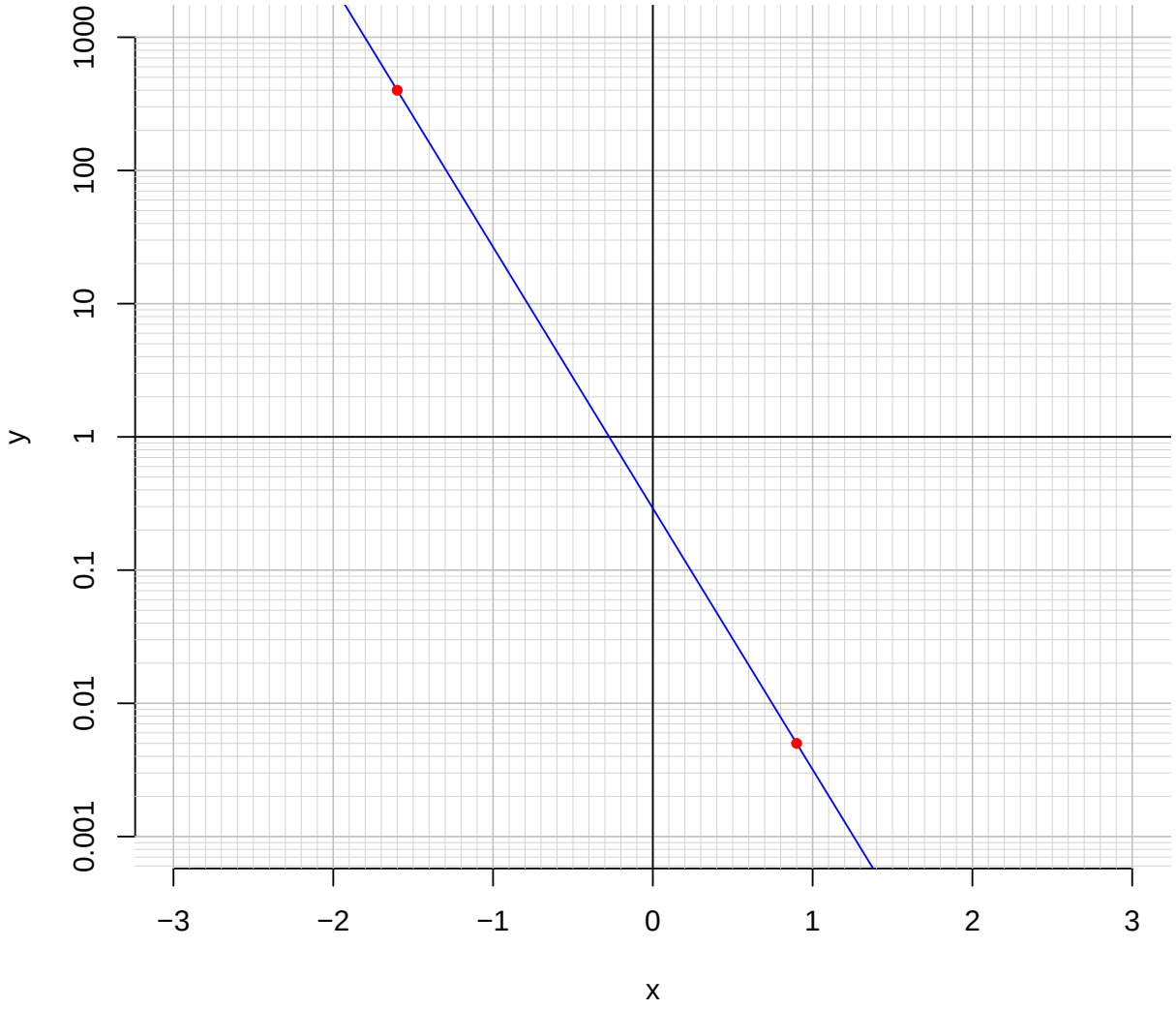
Divide both sides by $\frac{-3}{7}$.

$$\frac{-7}{3} \cdot \log_2\left(\frac{17 \cdot 5}{4}\right) = t$$

Switch sides.

$$t = \frac{-7}{3} \cdot \log_2\left(\frac{17 \cdot 5}{4}\right)$$

3. (10 pts) An exponential function $f(x) = 0.291 \cdot e^{-4.52x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-1.6)$.

$$f(-1.6) = 400$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{-1}{4.52} \cdot \ln\left(\frac{x}{0.291}\right)$$

Using the plot above, evaluate $f^{-1}(0.005)$.

$$f^{-1}(0.005) = 0.9$$